
Space Weather Forecast

Issued on Tuesday, 05 September 2023 at 01:19 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: Chance of isolated Moderate-class flares throughout. Slight chance of G1/Minor Storm conditions day 1 (05 Sep).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low with frequent, mainly low-level Common class flares. These have generally come from a sunspot region that has rotated off the visible disc, with the largest Common class flare of the period from this region. The majority of other flaring has come from a developing region approaching centre disc in the northern hemisphere.

Eight sunspot regions are present on the Earth-facing side of the sun. The sunspot region approaching the north-centre disc has shown the most growth and activity, with some complexity in its magnetic configuration. Elsewhere on the disc, most regions have remained stable or are showing some signs of decay with only a couple of new areas of growth. Two areas in the northeast have developed and are worth keeping an eye to see if they become more complex.

A minor Common-class flare in the southeast at 04/1349 UTC resulted in a Coronal Mass Ejection (CME) evident in solar imagery. This is currently being modelled but is expected to pass behind Earth. Otherwise no Earth-directed CMEs were detected in available solar imagery.

Solar Wind / Geomagnetic Activity: The solar wind environment was indicative of the gradual easing of the fast wind from a coronal hole, located in the northwest, with speeds reducing from around 450km/s to 360-400km/s by the end of the UTC day on 04 Sep. Total Interplanetary Magnetic Field (IMF) was Weak. The important north-south direction also varied weakly. Geomagnetic activity has been mostly Quiet (Kp1-2), with a single Unsettled (Kp3) interval between 04/0300-0600 UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at normal background levels throughout.

Four-Day Space Weather Forecast Summary

Solar Activity: Low solar activity is expected, with an ongoing chance of isolated Moderate flares on all days (05-08 Sep) most likely from the sunspot region near north-centre disc.

Solar Wind / Geomagnetic Activity: Background to Slightly Elevated solar winds should increase to become Slightly Elevated or Elevated by day 2 (06 Sep) due to a coronal hole enhancement. This is one of a few fast wind influences that could occur through the period with similar winds likely continuing throughout. There is a slight chance of a glancing impact from a CME on day 1 (05 Sep).

Quiet geomagnetic activity is expected to become Unsettled or Active on day 1 (05 Sep) with a slight chance of an isolated G1 Minor Storm (Kp5) interval. Activity through the rest of the period is likely to vary mainly between Quiet and Unsettled, but with a slight chance of isolated Active intervals.

Energetic Particles / Solar Radiation: High energy protons are expected to continue at normal background levels.

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Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	20	5	5	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	No	25	25	25	25
Very Active	R3 to R5 X	No	2	2	2	2

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	2	2	2	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm⁻²sr⁻¹s⁻¹)